

**Amendments to the Claims:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

1. (currently amended) A method for sparsely reading data representative of pixel energy of an active pixel and of neighboring pixels in at least one sensor segment—~~11~~ having a plurality of addressable pixels ~~12~~, the method comprising:

- (a) for each pixel in the at least one sensor segment storing in a lookup table—~~38~~ addresses of predefined neighboring pixels,
- (b) on determining that a pixel in the at least one sensor segment is active, using an address of said pixel to read from the lookup table corresponding addresses of the neighboring pixels associated therewith, and
- (c) reading data representative of pixel energy of the active pixel and of successive ones of its neighboring pixels.

2. (original) The method according to Claim 1, wherein the addresses of the predefined neighboring pixels associated with an active pixel correspond to pixels in more than one sensor segment.

3. (currently amended) The method according to Claim 1 or 2, further comprising:

- (d) calculating cumulative energy read from the active pixels and successive neighboring pixels as the respective pixel energy of each successive neighboring pixel is read, and
- (e) repeating (c) and (d) in respect of successive neighboring pixels only for as long as the cumulative energy is less than a predetermined value.

4. (currently amended) Use of the method according to any one of claims Claim 1 in a charge readout detector (10).

5. (currently amended) A readout circuit—(29) for reading active pixels—(12) in a sensor having at least one sensor segment—(11) each containing a plurality of addressable pixels—(12), the readout circuit comprising:

    a sampling circuit—(28) coupled to each pixel in each of the segments, for sampling an energy level associated with at least one active pixel,

    a lookup table—(38) having a plurality of addressable locations each corresponding to a respective pixel in the sensor and storing addresses of predefined neighboring pixels associated with the respective pixel, an encoder—(36) having a plurality of

input lines each for connecting to a respective trigger channel corresponding to each pixel in the sensor and responsive to one or more trigger signals for generating an address in said lookup table, and

a controller—(37) coupled to an output of the encoder for feeding the address generated by encoder to the lookup table and for feeding the addresses of the predefined neighboring pixels output by the lookup table to a respective channel of the sampling circuit for reading the energy level of the respective neighboring pixel.

6. (currently amended) The readout circuit according to Claim 5, wherein:

the sampling circuit includes a sample and hold unit—(28) in respect of each pixel in the sensor for carrying a corresponding sampled and held value of the respective pixel, and

there is provided in each segment an analog multiplexer—(35) having a plurality of addressable channels each coupled to a respective one of the sample and hold units for carrying the corresponding sampled and held value of the respective pixel.

7. (currently amended) The readout circuit according to Claim 5, wherein:

the sampling circuit includes a track and hold unit—(27) in respect of each pixel in the sensor for carrying a corresponding peak energy value of the respective pixel, and

there is provided in each segment an analog multiplexer—(35) having a plurality of addressable channels each coupled to a respective one of the track

and hold units for carrying the corresponding peak energy value of the respective pixel.

8. (currently amended) The readout circuit according to ~~Claim 6~~<sup>or</sup> ~~7~~, wherein the controller ~~(37)~~ is adapted to feed the addresses of the predefined neighboring pixels output by the lookup table successively to the analog multiplexer.

9. (currently amended) The readout circuit according to ~~Claim 5~~<sup>any one of</sup> ~~Claims 5 to 8~~, wherein each trigger channel includes:

    a threshold discriminator ~~(23)~~ responsive to a pixel energy level for producing an output signal when the pixel energy level exceeds a threshold value, and

    a resettable monostable ~~(24)~~ responsive to the output signal of the threshold discriminator for generating said trigger signal.

10. (currently amended) The readout circuit according to Claim 9, wherein the controller ~~(37)~~ includes:

    an accumulator ~~(39)~~ for calculating cumulative energy read from the active pixels and successive neighboring pixels as the respective pixel energy of each successive neighboring pixel is read, and

    a reset circuit ~~(40)~~ coupled to the accumulator and being responsive to the cumulative energy exceeding a predetermined value for resetting the encoder and the monostables.

11. (currently amended) The readout circuit according to ~~Claim 5~~<sup>any one of</sup> ~~Claims 5 to 10~~, wherein:

    the sensor includes at least first and second spatially separated sensor segments ~~(11)~~, and the

lookup table stores addresses of pixels in the second sensor segment in respect of one or more pixels in the first sensor segment.

12. (New) The method according to Claim 2, further comprising:

(d) calculating cumulative energy read from the active pixels and successive neighboring pixels as the respective pixel energy of each successive neighboring pixel is read, and repeating (c) and (d) in respect of successive neighboring pixels only for as long as the cumulative energy is less than a predetermined value.

13. (New) The readout circuit according to Claim 7, wherein the controller is adapted to feed the addresses of the predefined neighboring pixels output by the lookup table successively to the analog multiplexer.

14. (New) The readout circuit according to Claim 6, wherein each trigger channel includes:

a threshold discriminator responsive to a pixel energy level for producing an output signal when the pixel energy level exceeds a threshold value, and

a resettable monostable responsive to the output signal of the threshold discriminator for generating said trigger signal.

15. (New) The readout circuit according to Claim 7, wherein each trigger channel includes:

a threshold discriminator responsive to a pixel energy level for producing an output signal when the pixel energy level exceeds a threshold value, and a

resettable monostable responsive to the output signal of the threshold discriminator for generating said trigger signal.

16. (New) The readout circuit according to Claim 8, wherein each trigger channel includes:

a threshold discriminator responsive to a pixel energy level for producing an output signal when the pixel energy level exceeds a threshold value, and

a resettable monostable responsive to the output signal of the threshold discriminator for generating said trigger signal.

17. (New) The readout circuit according to Claim 14, wherein the controller includes:

an accumulator for calculating cumulative energy read from the active pixels and successive neighboring pixels as the respective pixel energy of each successive neighboring pixel is read, and

a reset circuit coupled to the accumulator and being responsive to the cumulative energy exceeding a predetermined value for resetting the encoder and the monostables.

18. (New) The readout circuit according to Claim 15, wherein the controller includes:

an accumulator for calculating cumulative energy read from the active pixels and successive neighboring pixels as the respective pixel energy of each successive neighboring pixel is read, and

a reset circuit coupled to the accumulator and being responsive to the cumulative energy exceeding a predetermined value for resetting the encoder and the monostables.

19. (New) The readout circuit according to Claim 16, wherein the controller includes:

an accumulator for calculating cumulative energy read from the active pixels and successive neighboring pixels as the respective pixel energy of each successive neighboring pixel is read, and

a reset circuit coupled to the accumulator and being responsive to the cumulative energy exceeding a predetermined value for resetting the encoder and the monostables.

20. (New) The readout circuit according to Claim 6, wherein:

the sensor includes at least first and second spatially separated sensor segments, and

the lookup table stores addresses of pixels in the second sensor segment in respect of one or more pixels in the first sensor segment.